

### REMARKS

This is in response to the Office Action mailed on October 5, 2004, and the references cited therewith.

Claims 1, 3, 4, 6, 8 and 9 are amended solely to provide precise antecedent basis. It is believed that the claims were clear to someone of average skill in the art prior to such amendments, and that their scope remains unchanged following the amendments. New claims 11 and 12 have been added. Claims 1-12 are now pending in this application.

#### §112 Rejection of the Claims

Claims 1-10 were rejected under 35 USC § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Claims have been amended as described above to address such rejection.

The Office Action also questions what an assignment score is, and also questions the Hungarian method and how it applies to the cost matrix.

Assignment scores are also well described in the application, at least starting on page 2 of the application in the last full paragraph, referring to Figure 2, which shows a more detailed example of the assigning of resources, with assignment scores specifically referenced in step 204, found by applying application-specific strategies. The second full paragraph on page 5 indicates that "The application specific strategies can be viewed as criteria for determining how valuable or desirable it is to assign a particular resource to a particular item." The next paragraph gives examples of the strategies based on a storage level of a buffer, its set up time, etc. The set up time, where the buffer is a chemical storage tank, includes the time to clean it if the previous chemical stored there is not compatible with the new chemical to be stored. This is pointed out in the second full paragraph on page 6.

As indicated in the application at page 8, second full paragraph, lines 20-21, "The Hungarian method is a known algorithm for solving assignment problems using an  $n \times n$  cost matrix." Further, the beginning of the last paragraph on page 8 recites: "A flowchart illustrating an example of the Hungarian method is shown in Figure 6. Figure 7 illustrates an example of applying the Hungarian method to the cost matrix."

A search of Google Scholar, on the Internet for “Hungarian Method” reveals the first three hits that are directly related, and quite old, showing that such a method is indeed well known in the art:

“[CITATION] The **Hungarian method** for the assignment problem - Web Search

HW Kuhn - Cited by 219

Naval Research Logistics Quarterly, 1955

[CITATION] A branch-and-bound algorithm for the quadratic assignment problem based on the **Hungarian method** - Web Search

PM Hahn, T Grant, N Hall - Cited by 19

European Journal of Operational Research, 1998

[CITATION] Variants of the **Hungarian method** for assignment problems - Web Search

HW Kuhn - Cited by 12

Naval Res. Logist. Quart, 1956”

Given the teachings in the art, and in the application itself, it is believed that one of average skill in the art will be adequately informed as to the meaning of the claim language. It is requested that the rejection be withdrawn.

#### §102 Rejection of the Claims

Claims 1 and 6 were rejected under 35 USC § 102(b) as being anticipated by Walker et al. (U.S. Patent No. 5,963,911). This rejection is respectfully traversed, at least on the basis that the reference does not show each and every element of the invention as claimed.

Claim 1 references identifying one or more assignment strategies for assigning resources to one or more items, determining an assignment score for each item/resource pair, and summing the assignment score by an assignment cost to produce a cost matrix. These elements, as described in the application and used in the claims are not found in Walker et al.

The Office Action indicates that Walker et al. identifies assignment strategies at Col. 1 line 56 to Col 2 line 12; Col 2, lines 8-12, lines 39-45 and lines 62-64; Col. 5, lines 58-61 and Col. 21, lines 53-54. The referenced language does not appear to describe the use of assignment strategies and for assigning one or more resources to one or more items as claimed. Instead, the cited language appears to determine the time when a resource is forecast to become available and assigns a cost function “calculated as a function of the time at which the job will be performed.” The total projected cost is then used to find the combination which the least cost. A plurality of

jobs may also be assigned to the same resource. Further, incompatibilities are taken into account if a technician cannot perform a particular job. However, Applicant fails to see how these amount to assignment strategies, especially as the term is used and defined. As described above, the second full paragraph on page 5 indicates that "The application specific strategies can be viewed as criteria for determining how valuable or desirable it is to assign a particular resource to a particular item.". The next paragraph gives examples of the strategies based on a storage level of a buffer, its set up time, etc. The set up time, where the buffer is a chemical storage tank, includes the time to clean it if the previous chemical stored there is not compatible with the new chemical to be stored. This is pointed out in the second full paragraph on page 6.

As can be seen, assignment strategies are quite different from just determining when resources are available and assigning a time dependent cost to them.

Claim 1 also references determining an assignment score for each item/resource pair. The Office Action refers to Col. 6, lines 64-66; Col. 7, lines 7-10 and lines 32-34; and col 8, lines 5-7. These sections of the references do not describe an assignment score as that term is used in the present application. Instead, they refer to cost estimates for a technician to perform a job, and the formation of a cost matrix with cost scores. Cost scores are not the same as assignment scores as that term is used in the application. Assignment scores take into account the actual application specific characteristics, such as set up time. As such, the rejection should be withdrawn.

To further highlight the differences between the invention as claimed, and the reference, the fourth element of claim 1 refers to multiplying each assignment score sum by an assignment cost to product a cost matrix. This element is clearly lacking in the reference. The Office Action points to cost calculations in the reference as describing the first three elements dealing with assignment strategies and assignment scores, however, the fourth element clearly indicates that they are not directly related to costs, and that the cost matrix is only formed when the scores are multiplied by "an assignment cost associated with the sum's corresponding item/resource pair to produce a cost matrix;" No such multiplication is found the language referenced in the Office Action. As such, a prima facie case of anticipation has not been established, and the rejection should be withdrawn.

Claim 6 contains similar references to the assignment strategy, assignment scores and multiplication by assignment costs to produce the cost matrix, and is believed to distinguish the reference for at least the same reasons. The remaining claims all depend from either claim 1 or claim 6, and are believed allowable for at least the same reasons.

§103 Rejection of the Claims

Claims 2-5 and 7-10 were rejected under 35 USC § 103(a) as being unpatentable over Walker et al. This rejection is respectfully traversed. Since these claims depend from claims 1 or 6, they are believed allowable for at least the same reasons as claims 1 and 6.

Conclusion

Applicant respectfully submits that the claims are in condition for allowance, and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney at (612) 373-6972 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.


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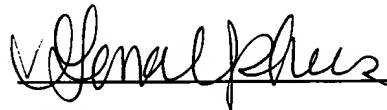
Date 1-5-2005

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: MS Amendment, Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 5 day of January, 2005.

Gina M. Uphus

Name



Signature